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SCIENCE VERSUS INSECTS

Lee A. Strong

Chief, Bureau of Entomology & Plant Quarantine, U. S. Department of  
Agriculture

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Announcer: You have just listened to a dramatic recital of man's world wide battle against the many-legged enemies that bore from without and within. This battle is going on in every country in the world and in every State of the Union. The State of California alone spent \$3,500,000 in 1934 to combat insect pests in the citrus belt. Insects are the only foreign invaders who have ever been able to entrench themselves successfully on American soil. You will now hear from Mr. Lee A. Strong, Field Marshal of the forces of the United States in its war against insects. Mr. Strong is the Chief of the Bureau of Entomology and Plant Quarantine of the Department of Agriculture. Mr. Strong will you tell us something about the strategies, the sanctions, and the embargoes employed by the Government to make America safe from insects, native and foreign?

Mr. Strong: In species and kinds insects outnumber most, if not all groups of living organisms. There are known more than seven hundred thousand kinds of described and named insects in the world. Of the fifty thousand kinds in North America there are estimated to be six thousand five hundred kinds of injurious insects in the United States reported as doing consistent damage.

Announcer: Mr. Strong, what is the tribute annually levied by insects on the United States?

Mr. Strong: That is a very difficult question to answer. First, it is very difficult to estimate the amount of damage that an insect actually does. Second, if this damage takes any considerable part of the crop the estimate in dollars and cents is faulty as the price of that crop, other things being equal, would be lower had the full crop been produced. But we have some very carefully prepared figures on thirty-four of our most important pests, and this very small proportion of the approximately six thousand five hundred kinds of pests, was estimated to destroy annually crops valued at over nine hundred million dollars. The total loss from the boll weevil is estimated at one hundred sixty-four million dollars annually, and the corn ear worm, which attacks not only corn but cotton and tomatoes, is held responsible for destroying over one hundred four million dollars' worth of crops. So it is fair to estimate that all insects destroy property to over two billion dollars annually.





Announcer: The World War has cost us to date forty-five billion two hundred million dollars. Compared with this what is the expense of the war against insects?

Mr. Strong: The cost of the World War is stupendous when compared with the expenditures by the Federal Government and the States in the war against insects. During the fiscal year 1935, with emergency funds of about fourteen million dollars and a two million three hundred thousand dollar special appropriation for grasshopper campaign, the total Federal expenditures amounted to but nineteen million five hundred thousand dollars for the Bureau of Entomology and Plant Quarantine, and the States using both Federal and State funds expended a total of seven hundred eighty-eight thousand dollars bringing the grand total of expenditures by Federal and State agencies to about twenty-two million dollars. One reason that makes constant exertion necessary is the enormous fecundity of insects. Taking the classic example of the ordinary vinegar fly as computed by Le Froy--if the offspring of a single pair lived for one year and none of the young died and none of the bodies decomposed, the total mass of ponderable material produced would bury the entire earth a million miles deep. Of course, this is nothing to worry about because it never would happen. In the first place, comparatively speaking, almost all the offspring die and all those that die do decay, so that there is no ponderable mass of sufficient size left to bury any part of the earth. Despite the fact that such a large proportion of the offspring of insects do die, however, there is an immense increase in the population of some destructive insects from year to year.

Announcer: In what regions have the insects done most damage?

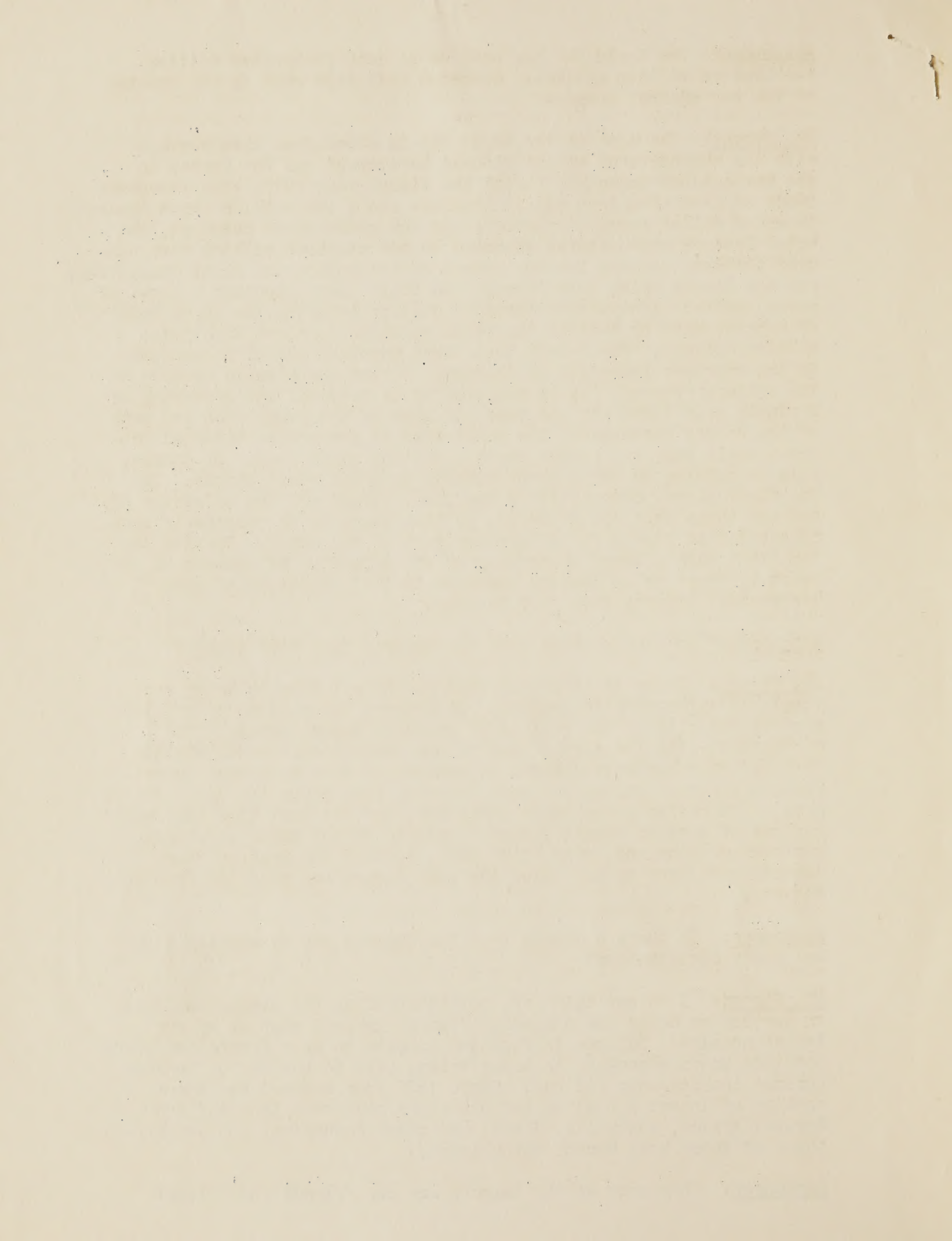
Mr. Strong: There is no region that can be set down as being particularly infested with insects. Of course, the regions of greatest crop values will be the regions of greatest insect damage. The Cotton Belt with its annual loss of one hundred sixty-four million dollars' worth of cotton could be considered as a very much insect-ravaged region. During the past three or four years the Great Plains have had terrific grasshopper outbreaks, and for that time they were regions of serious insect damage. Insects do not occur in equally destructive abundance year after year, so that the regions where insects have done or are doing the most damage are shifting from year to year.

Announcer: Is there a danger that the insects may eventually wipe out human civilization?

Mr. Strong: I do not think so, notwithstanding the staggering toll in destroying crops and spreading disease imposed upon us by our insect enemies. Science is fighting insects on many fronts and every possible known advantage is being taken, even to the use of insects against insects--bug eat bug. Since 1883 four hundred and three species of insect parasites and predators have been imported from Europe, Africa, Australia, Japan, and other countries, and seventy-three of these have become established.

Announcer: Then some of the insects are our friends and allies?







Mr. Strong: Yes. And we do everything to encourage them. Along with the effort to destroy injurious forms of insects, opportunities have not been overlooked to make more helpful to the human race such beneficial insects as the honey bee. Entomologists have determined that bees are more effective in gathering honey and pollinating plants if they can reach further with their tongues into deeper flowers for the nectar; hence, an effort has been made with substantial progress in developing bees with longer tongues. Since bees in nature mate on the wing only, this recourse to the practice of eugenics in the bee family has been difficult but successful. A real scientific achievement!

Insects are quite selective in their food habits and some plants upon which certain species of insects feed seem to have certain characteristics which render the plants resistant to insect damage. These characteristics are being studied and bred into plants with a view to growing insect-resistant varieties. Insects themselves are affected by diseases and attempts are being made to develop and culture these diseases with a view to using them in the fight against insects.

In studying and fighting insects, it must be remembered that many of the most injurious forms spend a considerable portion of their lifetime in the ground as larvae or worms. The Japanese beetle, for example, a serious pest of the Atlantic Seaboard, spends nine months of the year in the soil as a grub. Many of the wireworms are in the soil three years in the worm stage and, as is well known, the periodical cicada spends seventeen years in the soil. Entomologists are thus dealing with subjects which are frequently hidden and never able to give expression to the reactions of the various insecticides and other control measures used. For instance, experiments were conducted over quite a period of time with a certain poison in the effort to kill wireworms, the immature form of the click beetle, when physiological studies developed that the particular poisons being used were not being taken into the system by the bug, but were being thrown out before reaching the stomach.

Research studies to develop information on the structure, life history, and measures of control of insects are taken advantage of wherever possible in eradication over large areas and in some instances from the United States of injurious pests. The yellow-fever-carrying mosquito was eliminated in the Canal Zone to a point which made possible the construction of the Panama Canal.

One of the outstanding accomplishments in pest eradication any place in the world was the apparently complete extermination of the Mediterranean fruit fly in Florida in 1929 and 1930. As to the statement frequently heard that there never was any Mediterranean fruit fly in Florida, there is just as good and just as reliable scientific proof that the Mediterranean fruit fly did exist in the fruit cultures in Florida in destructive numbers as there is that the earth is round. The United States Department of Agriculture has in its possession specimens of the Mediterranean fruit fly taken from more than one thousand individual properties in the State of Florida in 1929 and 1930. These specimens are accurately, individually, and indisputably identified as the Mediterranean fruit fly by world specialists. The







eradication of this pest is but another demonstration of the fact that insects can be eradicated if the work is undertaken in time and if proper facilities are afforded.

Announcer: How stands the battle against termites?

Mr. Strong: The battle with termites is well under control. We have devised methods of insulating buildings against termite damage, and no new structures today--if proper precautions are taken--need suffer from termite damage at all. All that needs to be done in controlling termites is to cut off all connections between the wooden structure and the ground with metal guards. The termite cannot live without access to the soil. In addition to the actual injury caused by the insects themselves to plants and crops and humans by their biting, sucking, or chafing, they are also carriers of disease. They are vital factors in the spread of Tularemia, Rocky Mountain or spotted fever, malaria, bubonic plague, sleeping sickness, typhus fever, and yellow fever. They spread plant diseases from plant to plant. Insects carry the sugarcane mosaic. They spread the disease known as "peach yellows". An insignificant-looking beetle is at least one of the insects responsible for spreading the Dutch elm disease which now threatens the elms of this country.

The insignificant-appearing and obscure insects are the ones which frequently cause the most damage and are given the least recognition by the public. The black widow spider attacks only in self-defense. Yet it was sensationally publicized during the past year or two as ferocious, man-eating, and dangerous to the human race. But who heard anything about the bark beetles in the forests of the Northwest which in two years destroyed millions of acres of lodge pole pine leaving hardly a living specimen of pine in areas one hundred and fifty miles in length.

Some people say let the insects alone; don't destroy the balance of nature, but that was done long ago. When people started to move from locality to locality, from country to country; when they planted new crops and intermingled crops, they destroyed the balance of nature, so that is no argument for giving up control of insect pests.

While there are some benefits derived from insects, in the main their nature is to destroy. The battle is an age-old one and it must be continued. Insects will never inherit the earth unless man does what he has never done -- give up the struggle.

Announcer: Thank you, Mr. Strong, for your illuminating discussion. We have heard tonight how science is waging battle against the insects. We shall hear next week at the same hour another broadcast outlining the Battle of Science against human insects -- its War Against Crime.

(Mr. Strong unable to broadcast, talk read by Dr. Fracker)

